Voyager Bulletin

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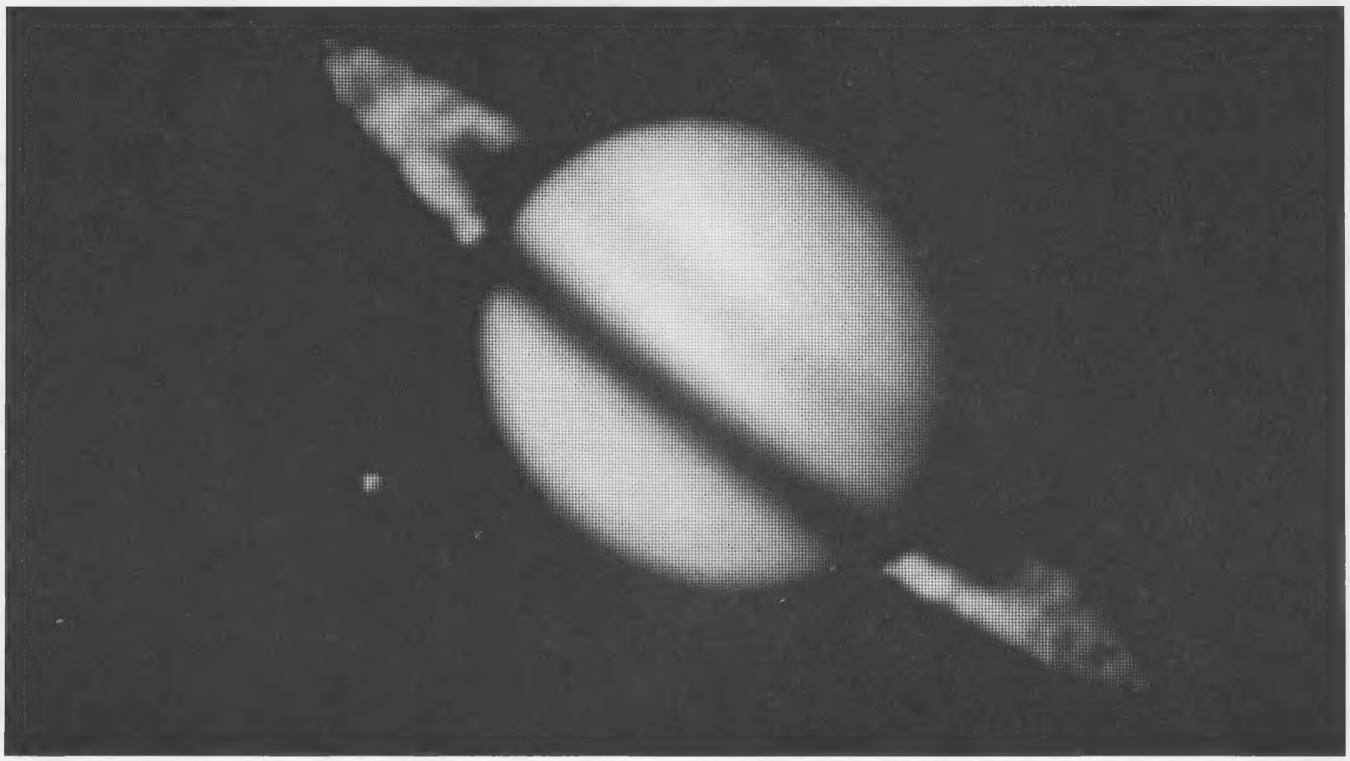

ITS SATURN! — Computer enhancement of this photo taken by Voyager 1 on March 20, 1980, shows Saturn's rings as well as one of its moons, Rhea (lower left). Voyager 1 was 312 million kilometers from the planet at this point.

President Carter Presents Goddard Trophy

America's most prestigious space award, the National Space Club's Goddard Memorial Trophy, has been presented to the Voyager Project by President Carter. In a March 24 ceremony at the White House, the president said:

"... the team that's made this flight possible and also had such tremendous success in bringing the images and the knowledge so clearly back to Earth to be shared by scientists and others interested in astronomy and our own solar system, deserve (sic) the highest accolades."

Jupiter's Satellites: 15

A 15th satellite of Jupiter has been discovered in photographs taken by Voyager 1 in March 1979. Tentatively named 1979 J2, the satellite orbits between the satellites Amalthea and Io, about 151,000 kilometers above Jupiter's cloudtops. Its orbital period is 16 hours 16 minutes and its diameter is estimated to be about 70 to 80 kilometers.

1979 J2 was discovered by Stephen Synnott of the navigation team while verifying the existence of the 14th satellite, 1979 J1, discovered last fall in photographs from Voyager 2's encounter with Jupiter last July.

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1979 J2 – The newly-discovered 15th moon of Jupiter (bottom) is seen with its shadow (top, at end of streak in clouds) against the face of the planet in this computer-enhanced photo taken by Voyager 1 on March 4, 1979. The satellite was discovered in April 1980 during continuing analysis of Voyager photos. It is 70 to 80 kilometers in diameter and orbits Jupiter every 16 hours 16 minutes at a distance of 151,000 kilometers above the cloudtops. This is the second satellite discovered from Voyager data; the first was found last October.

Update

Both Voyagers are in good health and on target for their respective Saturn encounters. Routine calibrations and tests, as well as sampling of the interplanetary medium, continue for both spacecraft, while Voyager 1 is taking periodic images of Saturn for calibration and navigation purposes.

Voyager 1 performed a cruise science maneuver on February 20, 1980, making a series of yaw and roll turns to allow calibration of the magnetometer and other instruments to view the entire sky. The maneuver was entirely successful; however, analysis of the telemetry showed slight differences from the predicted command issuance between the two computer command subsystem processors. This is the fourth instance of command problems aboard Voyager 1 since Jupiter encounter; therefore, a Spacecraft Anomaly Team has been formed to further investigate the on-board command problem. The team will assess the adequacy of current immediate protection programmed into the on-board computers; determine what diagnostic tests might be conducted; determine what failure or noise mechanism could have led to the observed problems; and investigate the feasibility of additional fault protection measures. The team's study should be completed by July 1, allowing time for corrective measures before the Saturn encounter activities begin in late August. Voyager 1 is scheduled to move off Earth-line several times during the encounter period with a high internal command activity, thus driving the necessity to implement protective measures to assure a successful Saturn encounter.

Safeguards for Voyager 2's mission have also been implemented. An updated "backup mission load" (BML) program is now stored in the spacecraft's computer command subsystem. This load will activate should Voyager 2 lose its remaining command receiver before Saturn encounter. The program provides a tremendous improvement over the previous BML in the amount of science data that would be returned from Saturn, and extends the data-gathering capability beyond Saturn to Uranus.

Both spacecraft are well within the power and fuel allocations for their respective missions. Before launch, each ship was loaded with 105 kilograms of hydrazine fuel. This propellant is stored in a tank mounted inside the ring of electronics compartments and carried to the thrusters via "plumbing" lines.

Three radioisotope thermoelectric generators (RTG) on each spacecraft convert the heat from nuclear fuel decay to electrical energy to operate the engineering and science mechanisms. Developed by the U.S. Department of Energy, such "atomic batteries" provide power for missions travelling distances too far from the Sun to utilize solar cell arrays for power conversion. The nuclear fuel for the generators is plutonium dioxide which is chemically-inert and has a long half-life (87.8 years) and low-shielding requirements. Heat generated by the radioisotope fuel is converted into electrical energy by silicon germanium thermocouples: The RTGs are kept at a constant electrical load by the power subsystem, which dumps excess power into space as heat. Power output aboard the spacecraft is now about 438 watts. The power usage of the science instruments at Saturn will be about 99 watts.

Signals between Earth and Voyager 1 now travel 61 minutes 19 seconds one-way. The spacecraft is about 1.1 billion kilometers from Earth, and its velocity (with respect to the Sun) is 21 kilometers per second.